STATE OF MISSOURI

Bob Holden, Governor • Stephen M. Mahfood, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

TES

Site: Herculaneum
ID# MOD006266373
Break: 1.0
Other:
5-29-01

May 29, 2001

A717

Mr. Rich Borman
Superintendent
Dunklin R-5 School District
277 Barclay St., P.O. Box 306
Herculaneum, MO 63048

Dear Mr. Borman:

I have enclosed a print out of the X-ray Fluorometer (XRF) results from metal sampling conducted on May 2, 2001, at four locations on school grounds. As we discussed, the sampling was not done with the quality control measures necessary to have a high level of confidence with the results. Therefore, these results should be considered rough estimates of metal concentrations in the top inch of soil.

The results have an identification label on the third line of each sample: "ID: <####>". The sample results also contain a value and a standard deviation. For a result to be considered quantifiable or valid, the value must be ten times the standard deviation. If a value is over three times the standard deviation, the element is considered present but at a low, unquantifiable concentration. Several metals are listed for each sample that should be disregarded due to standard deviation that is greater than three times the value.

Sample #HHS1 was taken from the southeast side of the track in a grassy area. The lead (Pb) concentration was 898 parts per million (ppm). Sample #HHS2 was taken in the middle of the football field, and had a Pb concentration of 1402 ppm. Sample #HH3 was taken at the practice field across the street from your office, and had a Pb concentration of 347 ppm. Sample #HHS4 was taken at the new building location, and had a Pb concentration of 102 ppm. Cadmium concentrations, which typically are of concern at Pb mining or smelting sites, were less than the detection level of the XRF. This means that cadmium concentrations in soil at the facility were probably less than 50 ppm.

There is no hard and fast standard for what concentration of Pb is considered safe. Site specific factors are usually taken into account before determining an appropriate cleanup level. The Missouri Department of Natural Resources, in conjunction with the Department of Health, has created an Any Use Soil Level of 260 ppm. This would be a concentration that would be considered safe at any conceivable use by children or adults. However, the U.S. Environmental Protection Agency (EPA) will typically not consider any action at a site unless soil concentrations are over 400 ppm. The action that EPA and the department have negotiated with Doe Run would require a soil cleanup for a residential yard if the average soil lead is over 400 ppm. EPA is also in the process of developing an adult exposure concentration that typically would be used for a commercial or industrial facility and is based on exposure to a pregnant mother. The concentration of Pb that is being considered for this standard ranges from 700 to 1700 ppm. Concentrations of Pb in a residential setting that exceed 2500 ppm typically are considered by EPA within this region as those needing time-critical action (cleanups taking between six months and two years to complete).

The soil Pb concentrations on and around the football field would qualify for a cleanup action under the order negotiated with Doe Run, if it was considered a high child-use area. Lead contamination at the facility could be managed to greatly reduce, if not eliminate, exposure in the interim period prior to soil replacement. As you know, these management options and relative exposure risks will be discussed in our June 1, 2001, meeting with the Department of Health.

If you have any questions regarding these comments, you may contact me at (573) 751-1288.

Sincerely,

HAZARDOUS WASTE PROGRAM

David E. Mosby, R.G.
Environmental Specialist

Enclosure

DM:lw

c. Ms. Angela Minor, DOH
Mr. Tony Petruska, EPA

Application:SOILS with U,Th,Ag Q101 07-08-1992
Meas Time: 2-MAY-2001 14:49:52
ID: <HHS1>
( ) ( )

	Value	Std. dev.	
CrHI	910.106	294.610	ppm
K	9686.63	622.994	ppm
Ca	8038.63	396.432	ppm
Ti	1178.22	191.278	ppm
CrLO	687.896	195.786	ppm
Mn	1157.18	319.877	ppm
Fe	12311.9	470.563	ppm
Co	376.163	177.949	ppm
Cu	138.995	42.2887	ppm
Zn	605.552	55.7192	ppm
Sr	73.5833	8.23314	ppm
Zr	165.787	7.42538	ppm
Mo	9.33221	3.73538	ppm
Pb	898.211	47.2515	ppm
Rb	23.6896	10.6604	ppm
Ba	250.020	15.0825	ppm
U	14.0968	9.42974	ppm
Th	17.6745	9.51497	ppm

Application:SOILS with U,Th,Ag Q101 07-08-1992
Meas Time: 2-MAY-2001 14:56:07
ID: <HHS2>
( ) ( )

	Value	Std. dev.	
K	12503.4	720.289	ppm
Ca	14919.1	537.756	ppm
Ti	1993.42	222.429	ppm
CrLO	619.894	214.253	ppm
Mn	335.642	280.242	ppm
Fe	13473.3	498.513	ppm
Co	182.514	180.110	ppm
Ni	94.5161	68.7986	ppm
Cu	142.227	45.6522	ppm
Zn	259.710	44.5594	ppm
Sr	114.522	10.1916	ppm
Zr	274.717	9.55168	ppm
Mo	4.34391	4.19789	ppm
Pb	1402.41	59.1038	ppm
Rb	42.0261	12.0673	ppm
Ba	332.341	17.5919	ppm
Th	15.5960	11.1361	ppm

Application:SOILS with U,Th,Ag Q101 07-08-1992
Meas Time: 2-MAY-2001 15:05:17
ID: <HH3>
( ) ( )

	Value	Std. dev.	
K	11700.1	687.012	ppm
Ca	6458.60	374.689	ppm
Ti	951.230	201.064	ppm
CrLO	373.106	219.172	ppm
Mn	980.170	308.424	ppm
Fe	12895.4	481.671	ppm
Ni	64.5263	62.5534	ppm
Cu	85.5142	40.5232	ppm
Zn	132.541	37.9131	ppm
Sr	129.694	10.3351	ppm
Zr	264.024	9.08323	ppm
Mo	6.01915	4.22564	ppm
Hg	51.6145	34.3982	ppm
Pb	346.868	31.4702	ppm
Rb	42.4561	12.2565	ppm
Sn	43.8707	39.3135	ppm
Ba	436.827	19.5653	ppm
U	27.1665	11.0896	ppm
Th	21.9448	8.70659	ppm

Application:SOILS with U,Th,Ag Q101 07-08-1992
Meas Time: 2-MAY-2001 15:13:39
ID: <HHS4>
( ) ( )

	Value	Std. dev.	
CrHI	851.539	305.192	ppm
K	13317.9	713.152	ppm
Ca	4153.12	311.708	ppm
Ti	1993.16	262.230	ppm
CrLO	511.017	214.312	ppm
Fe	21578.3	624.382	ppm
Co	885.989	235.762	ppm
Zn	92.9887	35.1401	ppm
As	43.0294	30.9039	ppm
Sr	95.5570	9.38562	ppm
Zr	327.052	10.2615	ppm
Mo	7.14773	4.34013	ppm
Pb	102.043	21.3512	ppm
Rb	68.2792	12.8878	ppm
Sb	39.3759	25.1979	ppm
Ba	457.847	20.4033	ppm
Th	22.0487	7.77940	ppm